

## Claims

- [c1] A music file generating apparatus, comprising:
- a singing voice extraction means that extracts singing voices from digital voice data in which said singing voices and voices other than such said singing voices are mixed, and obtains the singing voice data in the PCM format;
  - a MIDI generating means that generates the BGM data in the MIDI format, generates simulated singing voice data in the MIDI format corresponding to the singing voices extracted by said singing voice extraction means, adds said simulated singing voice data to said BGM data, and adjusts the MIDI data; and
  - a file generating means that processes the singing voice data in the PCM format generated by said singing voice extraction means and the BGM and simulated singing voice data in the MIDI format generated by said MIDI generating means as a single music file.
- [c2] The music file generating apparatus according to claim 1, wherein said voices other than singing voices are BGM.
- [c3] The music file generating apparatus according to claim 1, wherein said voices other than singing voices are

noises.

[c4] The music file generating apparatus according to claim 1, wherein said singing voice extraction means performs a procedure of bandwidth limiting of the digital voice data composed of a mixture of said singing voices and said voices other than singing voices up to a predominated frequency band corresponding to said singing voices.

[c5] The music file generating apparatus according to claim 1, wherein the music file generated by said file generating means is structured to include the MIDI reproduction control information so as to reproduce said BGM and simulated singing voice data in the MIDI format generated by said MIDI generating means, and the PCM reproduction control information so as to synthesize said singing voice data in the PCM format generated by said singing voice extraction means for said simulated singing voice data and to reproduce such singing voice data.

[c6] A music file generating method, comprising:  
a first step that extracts singing voices from the digital voice data composed of a mixture of said singing voices and voices other than said singing voices, and obtains the singing voice data in the PCM format;

a second step that generates BGM data in the MIDI format;

a third step that generates simulated singing voice data in the MIDI format corresponding to the singing voices extracted in said first step, adds said simulated singing voice data to the BGM data generated in said second step, and adjusts the MIDI data; and

a fourth step that processes the singing voice data in the PCM format generated in said first step and the BGM and simulated singing voice data in the MIDI format adjusted in said third step into a single music file.

[c7] The music file generating method according to claim 6, wherein said voices other than singing voices are BGM.

[c8] The music file generating method according to claim 6, wherein said voices other than singing voices are noises.

[c9] The music file generating method according to claim 6, wherein in said first step, a procedure of bandwidth limiting of the digital voice data composed of a mixture of said singing voices and said voices other than singing voices up to a predominated frequency band corresponding to said singing voices is performed.

[c10] The music file generating method according to claim 6, wherein in said fourth step, a procedure of adjustment is

performed to synthesize the reproduction timing of said singing voice data in the PCM format that has been generated in said second step, and said BGM and simulated singing voice data in the MIDI format generated in said third step.

[c11] The music file generating method according to claim 6, wherein the music file generated in said fourth step is structured to include the MIDI reproduction control information so as to reproduce said BGM and simulated singing voice data in the MIDI format generated in said third step, and the PCM reproduction control information so as to synthesize said singing voice data in the PCM format generated in said second step for said simulated singing voice data and to reproduce such singing voice data.

[c12] A recorded medium readable by computer, comprising:  
PCM data composed of singing voices in the PCM format;  
and  
MIDI data where simulated singing voice data in the MIDI format that is generated corresponding to the singing voices of said PCM data is added to BGM data in the MIDI format;  
wherein a music file with a data structure where said PCM data and said MIDI data are integrated into a single file is recorded.

[c13] A recorded medium readable by computer according to claim 12, wherein said music file includes the MIDI reproduction control information so as to reproduce said MIDI data, and the PCM reproduction control information so as to synthesize said PCM data to said MIDI data and to reproduce such PCM data.